

# REMARKS

Claims 1 - 20 are pending, with claims 1 - 17 and 19 having been finally rejected, and claims 18 and 20 having been objected to.

It is noted that the specifics of the “Final Rejection” (dated November 17, 2006) are very similar to that of the Office Action dated May 2, 2006. Thus, except for claims 18 and 20 having now been objected to rather than rejected, the only differences between the Final Rejection and the earlier rejection are in the Response to Arguments (paragraph 10) and the Conclusion (paragraph 11). Because of the length of both Office Actions, these remarks have been prepared in two parts for the convenience of the reader.

First, with regard to the “Response to Arguments”, the Examiner is **incorrect** in asserting that an “f ·  $\theta$  lens” is an “imaging lens”. As is well known to one of ordinary skill in the art, an “f ·  $\theta$  lens” is **not** an “imaging lens”, rather it is a type of **scanning lens**. **Also**, the Examiner is **incorrect** in asserting that an “image” passes through an “f ·  $\theta$  lens”. Although an “f ·  $\theta$  lens” is commonly used in systems that form (or read) images, **contrary to the Examiner’s assertion**, no “image” passes through an f ·  $\theta$  lens (at least not without being **so distorted** that it would not be **useful** as an image). Rather, **only from one to a small number of pixels** (e.g., typically four for color images) pass through an “f ·  $\theta$  lens” at a given time. The “image” (in the case of writing an image) is created by sequentially modulating the intensity of laser light(s) with image information so as to form **pixels** that pass through the f ·  $\theta$  lens so as to then **create** an image from the image information as scanning of the laser light(s) by a scanning element occurs. For this reason, as well as for the reasons pointed out below, the rejection of claims 1 - 17 and 19 using U.S. Patent No. 6,067,106 to Ishibe et al., U.S. Patent No. 5,991,063 to Ando, and U.S. Patent No. 5,671,077 to Imakawa et al. (that **each** disclose the use of a scanning element used in conjunction with an f ·  $\theta$  scanning lens) is clearly improper. The Examiner is invited to search “scanning lens” versus “imaging lens” on the Internet. Doing this should make it immediately apparent that ‘scanning lenses’ are separate products from ‘imaging lenses’ due to their entirely different characteristics and functions (as discussed in Applicant’s previous response). As noted

previously, the limitation 'imaging lens' is a "term of art" to one of ordinary skill in the art. **Therefore, it is entirely appropriate for Applicant to limit the scope of his claims by using such a well known and widely used term to distinguish the present invention from the structure of an f- $\theta$  lens** (as well as from other scanning lenses). Attached hereto are several pages downloaded from the Internet (many more exist) that provide support for Applicant's position that the terms "imaging lens" and "scanning lens" are terms of art to those of ordinary skill in the art, and that an "f- $\theta$  lens" is **not** an "imaging lens". Rather, an "f- $\theta$  lens" is a type of scanning lens.

Second, except for the bolded wording in the fifth line of the next paragraph and the wording in the final three paragraphs, the arguments below are the same as presented in Applicant's previous response filed September 5, 2006. They are repeated here in order to comply with the Rules of Practice.

Claims 1 and 9 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,067,106 to Ishibe et al. Reconsideration of this rejection is respectfully requested. The term "imaging lens" as used in Applicant's specification and claims is a term of art in the field of optics. Also, the term "f- $\theta$  lens" is a term of art in the field of optics. These two types of lenses are entirely different in **structure and function**, and thus an "f- $\theta$  lens" is not an "imaging lens" and vice-versa. An "imaging lens" is a lens that forms images wherein the lens designer minimizes optical aberrations so that the image is a faithful reproduction of the object being imaged. The light rays entering the lens are non-parallel. An f- $\theta$  lens is a lens that focuses a scanned light beam from a rotating deflector to a spot (normally, the spot is the size of a pixel of an image) wherein the designer purposely designs large optical aberrations into the lens for the purpose of making the linear speed of the scanned spot constant so as to scan a document for reading or writing pixels of the document. The light rays entering an f- $\theta$  lens are usually parallel. If one attempted to use an "f- $\theta$  lens" as an imaging lens, the resultant image would be greatly distorted and entirely unsatisfactory. Moreover, if one attempted to use an "imaging lens" as an "f- $\theta$  lens", the scanning spot speed would be maximum near the margins of a document (i.e., at large field angles  $\theta$ ) and minimum near the center of the document (i.e., on axis). Such a non-

uniform scanning speed would cause problems when attempting to modulate the scanning light beam with information so as to impart information to, or read information from, a document. Large aberrations are intentionally designed into an  $f-\theta$  lens in order to make the scanning speed of a scanned light beam on a document constant, irrespective of the field angle  $\theta$ . However, such a lens would be entirely unsuitable, due to its large optical aberrations, if it were to be used as an “imaging lens”, as this term is used in the field of optics. The lens 16 in Fig. 9 of Ishibe et al. is thus not an “imaging lens” as is claimed since (as discussed at col. 17, lines 28 - 45, of the ‘106 patent to Ishibe et al.) it is an “ $f-\theta$  lens”. Thus, it is respectfully submitted that claim 1 and dependent claim 9 are **not** anticipated by U.S. Patent No. 6,067,106 to Ishibe et al.

Claims 3, 7, 11 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,991,063 to Ando in view of U.S. Patent No. 5,671,077 to Imakawa et al. Reconsideration of this rejection is respectfully requested. In column 5, lines 3 - 8 of Ando, it is disclosed that the scanning lens 7 has “ $f-\theta$ ” characteristics in the scanning line direction. Therefore, for the same reason as discussed above, it is respectfully submitted that the combination of Ando and Imakawa et al. as discussed by the Examiner, would **not** have made the invention of claim 3 obvious, since neither Ando nor Imakawa et al. relate to an “imaging lens” (a term of art in optics, as noted above) and as claimed in claim 3 at line 3. With regard to claims 7, 11, and 15, as each is dependent (directly or indirectly) from claim 3, these claims would not have been unpatentable over Ando in view of Imakawa et al. at least for the reason claim 3 is not unpatentable over Ando in view of Imakawa et al.

Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,067,106 to Ishibe et al. in view of U.S. Patent No. 5,912,768 to Sissom et al. Reconsideration of this rejection is respectfully requested. As discussed above in discussing the rejection of claim 1, the lens 16 of Ishibe et al. is an  $f-\theta$  lens and is **not** an “imaging lens” (a term of art in optics, as discussed above) as claimed in line 1 of claim 2. Therefore, the combined teachings of Ishibe et al. and Sissom et al., discussed by the Examiner, would **not** have made the invention of claim 2 obvious.

Claims 5 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Patent No. 6,067,106 to Ishibe et al. in view of U.S. Patent No. 5,956,070 to Paoli et al.

Reconsideration of this rejection is respectfully requested. As discussed above in discussing the rejection of claim 1, the lens 16 of Ishibe et al. is an f- $\theta$  lens, not an “imaging lens” as claimed in line 1 of claim 5. Therefore, the combined teachings of Ishibe et al. and Paoli et al. discussed by the Examiner, would **not** have made the invention of claim 5 obvious. It is noted that the lens 20 of Paoli et al. is an imaging lens. However, it is respectfully submitted that the limitations in lines 4 - 7 of claim 1, from which claims 5 and 13 (directly or indirectly) depend, patentably distinguish claims 5 and 13 from the combination of Ishibe et al. in view of Paoli et al.

Claims 6, 10, 14, 17 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,067,106 to Ishibe et al. in view of U.S. Patent No. 5,912,768 to Sissom et al. as applied to claim 2, and further in view of U.S. Patent No. 5,956,070 to Paoli et al.

Reconsideration of this rejection is respectfully requested. As discussed above in discussing the rejection of claim 1, the lens 16 of Ishibe et al. is an f- $\theta$  lens, not an “imaging lens” as claimed in line 1 of claim 1. As claims 6, 10, 14, 17 and 19 each (indirectly) depend from claim 1, the combined teachings of Ishibe et al., Sissom et al., and Paoli et al., discussed by the Examiner, would **not** have made the invention of claims 6, 10, 14, 17 and 19 obvious. It is noted that the lens 36 of Sissom et al. is an imaging lens. However, it is respectfully submitted that the limitations in lines 4 - 7 of claim 1, from which claims 6, 10, 14, 17 and 19 indirectly depend, patentably distinguish claims 6, 10, 14, 17 and 19 from the combination of Ishibe et al., Sissom et al., and Paoli et al.

Claims 4, 8, 12 and 16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,991,063 to Ando in view of U.S. Patent No. 5,671,077 to Imakawa et al. as applied to claim 3, and further in view of U.S. Patent No. 5,912,768 to Sissom et al.

Reconsideration of this rejection is respectfully requested. As discussed above in discussing the rejection of claim 3, neither Ando nor Imakawa et al. relates to an “imaging lens” as is claimed in line 3 of claim 3. As claims 4, 8, 12, and 16 each (directly or indirectly) depend from claim 3, the combined teachings of Ando, Imakawa et al., and Sissom et al. discussed by the Examiner would **not** have made the invention of claims 4, 8, 12 and 16 obvious. As noted above, although

the lens 36 of Sissom et al. is an imaging lens, it is respectfully submitted that the limitations in lines 5 - 16 of claim 3, from which claims 4, 8, 12 and 16 (directly or indirectly) depend, patentably distinguish claims 4, 8, 12 and 16 from the combined teachings of Ando, Imakawa et al. and Sissom et al.

Claims 18 and 20 stand objected to as being dependent upon a rejected base claim, but otherwise allowable if rewritten in independent form, including all the limitations of the base claim and any intervening claims. Reconsideration of this objection is respectfully requested on the basis that the rejection of Applicant's base claims is believed to be improper.

Attached hereto are Exhibits A - G, which clearly show that 'scanning lenses' are separate products from 'imaging lenses' due to their entirely different characteristics and functions.

Therefore, unless more pertinent prior art is found, it is respectfully requested that the rejections and objections of record be reconsidered and withdrawn, and that an early Notice of Allowability provided.

Respectfully submitted,

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Attachments: Exhibit A - "Understanding fundamentals of imaging lenses" (5 pages),  
downloaded 11/19/2006 from Internet URL:  
[http://vsd.pennet.com/Articles/Article\\_Display.cfm?Section=ARCHI&ARTICLE\\_ID=2...](http://vsd.pennet.com/Articles/Article_Display.cfm?Section=ARCHI&ARTICLE_ID=2...)

Exhibit B - "Imaging lenses are compatible with large camera sensors" (3 pages),  
downloaded 11/19/2006 from Internet URL:  
<http://news.thomasnet.com.fullstory/494387>

Exhibit C - "Special! Infinite Conjugate Micro Video Imaging Lenses" (2 pages).  
downloaded 11/19/2006 from Internet URL:  
<http://www.edmundoptics.com/US/onlinecatalog/displayproduct.cfm?productID=1281>

Exhibit D - "CMOS Lens Selection and Suppliers" (2 pages), downloaded  
11/19/2006 from Internet URL:  
<http://www.micron.com/innovations/imaging/lens>

Exhibit E - "Focusing Objective Theory" - 1 page, downloaded 11/18/2006 from  
Internet URL:  
<http://www.specialoptics.com/Theory/Pg%2030%20Focusing%20Objective%20Theory.pdf>

Exhibit F - "Scanning Lens Theory" (3 pages), downloaded 11/18/2007 from  
Internet URL:  
<http://www.specialoptics.com/Theory/Scanning%20Lens%20Theory.pdf>

Exhibit G: Blue Hill Optical Technologies Internet Home Page (2 pages),  
downloaded 11/18/2006 from Internet URL:  
<http://www.bluehilloptical.com/>